



University of Tehran
School of Electrical and Computer Engineering

Course:	Multimedia Systems Laboratory - 8101711										
Course type:	EE*							CE*			Credit: 3
	Com	E	P	B	Con	D	SW	HW	IT		
	Required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Elective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Level:	Undergraduate <input checked="" type="checkbox"/> Graduate <input type="checkbox"/>										
Co-requisite(s):	An Introduction to Multimedia Systems - 8101710										
Prerequisite(s):	An Introduction to Multimedia Systems - 8101710										
Prerequisite by topic:											
Textbook(s):	Laboratory manual										
Coordinator:	Mahmoud Reza Hashemi										
Goals:	<p>The objective of this laboratory is to provide students with hands-on experience on the material provided in the introduction to multimedia systems course, to re-enforce the theory presented in that course.</p> <p>In the twelve experiments offered weekly, students examine the main concepts of digital image and video, their corresponding compression standards, digital audio concepts and corresponding compression methods, video and audio transmission over networks and the impact of network features on multimedia content, and multimedia content production tools, in a hand-on manner.</p>										
Outcome:	<p>Students who successfully complete this course will be familiar with the following concepts:</p> <ol style="list-style-type: none"> 1. Fundamentals of digital image (resolution, color depth, brightness, image file formats) 2. Converting color spaces, quantization, compression ratio, distortion and quality 3. Editing a digital image (resizing, rotating, changing color intensity) 4. Frequency domain transforms (DCT) and quantization in this domain 5. Video compression techniques 										

	6. Rate/Distortion in video encoding (mostly using the H.264/AVC standard software) 7. Audio playback and audio quality, low- and high-pitched sounds 8. Frequency and energy of vowels/ consonants and voiced/un-voiced 9. Nyquist sampling rate and the effect of quantization on digital audio quality 10. Video and audio conferencing 11. Effect of network traffic on wireless and wired network communication 12. The effect of network error, network traffic and QoS in wireless networks 13. Creating, editing and composing multimedia content using multimedia creation tools										
Topics:											
Computer usage:	Students are expected to work with applications such as Matlab, and programming languages such as C or C++ for their experiments.										
Assignments:	Each lab consists of a pre-lab and a post-lab report.										
Projects:	Students perform a term project on topics related to multimedia										
Grading:	<table> <tr> <td>Attendance</td> <td>10%</td> </tr> <tr> <td>Pre lab</td> <td>15%</td> </tr> <tr> <td>Labs</td> <td>25%</td> </tr> <tr> <td>Lab Reports</td> <td>25%</td> </tr> <tr> <td>Final Project</td> <td>25%</td> </tr> </table>	Attendance	10%	Pre lab	15%	Labs	25%	Lab Reports	25%	Final Project	25%
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Further readings:	[1] M. Ghanbari, Standard Codecs: Image Compression to Advanced Video Coding, 3rd ed., Institution of Engineering and Technology, 2011. [2] Ralf Steinmetz, Klara Nahrstedt. Multimedia Systems, Springer, 2010.										
Prepared by:	Mahmoud Reza Hashemi										
Date:	Last update 2014										